WE CLAIM:

SUB B1

1. A software architecture for an information technology platform, comprising of always-on and event-driven, engines, interfaces and processes and using intelligent molecular software data objects for interactive data records.

2. The architecture in claim 1, further comprising:

a. an Intelligent Molecular Object (IMO), a versatile, data-enabling software object, which provides for real-time translation, integration, and object-to-object / object-to-analysis tools communication at the object data level, to allow multidimensional, platform-independent complex queries in real-time;

b. an Intelligent Object Handler (IOH), which provides the application framework and user interface for IMO data, to allow for seamless integration of their benefits into legacy systems; and

c. an Intelligent Object Pool (IOP), comprising one global virtual data pool comprised of IMO data, which integrates diverse data resources on any system or network to provide result aggregation and instant answers across diversified data subsets.

3. The architecture in claim 2, wherein the IMO is further comprised of:

a. a unique identifier (UID), comprising a property pane layer created at IMO generation, which provides typically a 10 byte, alphanumeric unique identification on any system or network;

b. an object access manager (OAM), a property pane layer which governs data security and access according to UID permissions;

c. an object root router (ORR), a property pane layer which contains information to define the origin of the object within the system or network;

d. an interactive content router (ICR), a property pane layer which routes content and results interactively across the system or network;

e. a status management component (SMC), comprised of an object state engine and certain interfaces, which monitors data integrity and command history in GLP/GMP-compliance via state history and governs table lookup actions via the ICR;

f. a property pane controller (PPC), which controls the initiation of IMO communication according to activation by claims 3a through 3d, above;

g. vector subsets (VSS) for automatic, dynamic, or user-defined workspace definitions, which provide vectorized, direct addressing of data subsets for the ICR to minimize network traffic;

h. meta-data indices (MDX), to provide efficient access via dynamically updated meta-data description relevant to extant data queries and definitions;

i. object pane descriptors (OPD), which provide information about each object property pane and their function as required for direct communication with diversified applications and databases;

j. an interface for direct information interchange (DII), which provides the interface to communication at the object level;

k. an application translator link (ATL), which activates the OAM and ICR to determine the property panes for functional presentation and access within a given application or database environment;

l. an object graph preview (OGP) pane, comprising a limited resolution image and graphics viewer for quick graphical data review, particularly of image data and spectral datasets;

m. a raw data matrix (RDM), comprising a property pane which provides the full information subset for any data format or structure; and,

n. matrix structure definitions (MSD), which allows for data field mapping and enables vector access to specific data fields.

4. The architecture in claim 2, wherein the IOH further comprises:

a. a unified presentation layer (UPL), which provides a web-enabled graphical user interface (GUI) to integrate components and/or modules from diverse applications, laboratory systems environments and to act as handler for IMO data;

b. a user definition administration shell (UDA), which sets ups and governs access privileges to individual IMO data at the user-defined level and is accessible within heterogeneous network environments;

c. at least one engine for data object normalization and standardization, image normalization and standardization, IMO data translation, distributed learning, and knowledge extraction;

d. at least one access interface to and in-between instruments, data and applications, comprising interfaces which include, but are not limited to, direct instrument acquisition and control, application translation, direct object query, result generation, and legacy synchronization;

e. a master query component (MQC), create complex, multidimensional queries, containing pre-defined, configurable subsets of forms commonly used, but not restricted to, in diverse areas of Life Sciences;

f. an IMO generator (IMO-G), an event-driven component to acquire data from heterogeneous data resources, including from ongoing data acquisition, in real-time and transforms device outputs and heterogeneous data types to IMO data;

g. an IMO handler (IMO-H), which enables user management of IMO data utilizing integrated meta-data tags and pointers;

h. an IMO application framework (IMO-A), which provides integration and access protocols to heterogeneous applications and databases on the object level;

i. an application definition generator (ADG), which automates the query and generation of application and defines computing environments for the IMO data translation;

j. at least one data type translator (DTT), which define the data type dependencies for the IMO-G according to the applications and database environments defined by the ADG; and

k. an automated application assembly component (AAA), which provides for just-in-time (JIT) module linking.

5. The architecture in claim 2, wherein the IOP further comprises:

a. sets of Intra-Pools (iPools), regulated by boundary protocols, which provide data subset management and the define integrity and persistence of IMO relationships;

b. iPool security authentication protocols (iPSA), which authenticates iPool data requests according to user login and object data identification;

c. iPool availability monitoring protocols (iPAM), which define the iPool availability and access requirements of diverse data subsets;

d. iPool exchange protocols (iPEP), which determine and govern iPool data exchange protocols according to user-defined criteria;

e. an object integrity assessment component (OIA), which assess object integrity for security and QA / QC;

f. sets of engines and interfaces to access and generate ranked results within the IOP, including but not limited to an integrity assessment interface, a real-time meta-data linking interface and an iPool-to-iPool query interface;

g. an iPool meta-data index (iMDX), which provides dynamic, automated, and user-defined meta-data indices at the iPool level;

h. an aggregate meta-data index (aMDX), which provides dynamic, automated, and user-defined meta-data indices at the aggregate IMO level, inclusive of all relevant data resources;

i. an object-to-object query meta-data sorter (OQM), to generate temporary tables based on dynamic, automated, and user-defined meta-data indices; and

j. an aggregate real-time significance generator (aRSG), which provides for significance detection of values based on query parameters, meta-data indices when relevant, and IMO data ranking.

6. The architecture in claim 4, wherein the engines further comprise:

a. an object state engine (OSE), which provides a continuously-running (always on) set of processes, which monitor and govern activities of IMO data, performing real-time recording, updating and logging functions in GLP/GMP-compliant format.

7. The architecture in claim 4, wherein the engines further comprise:

a. a set of IMO standardization techniques (IMO-S), comprising engines which provide algorithms for tracking, standardization and/or normalization of object data;

b. an generic object normalization engine (ONE), which extracts variable and non-variable regions within any set of object data and generates a global standard to which all data can be referred;

c. an engine for global image normalization (GIN), which extracts variable and non-variable regions within any set of image data and generates a global standard to which all data can be referred;

d. an object translation engine (OTE), which is comprised of methods and functions for real-time meta-data extraction and table generation of raw data matrix, data object, data field, data structure, data functional information, data type, database type, and application type definitions for the OPD;

e. a distributed learning engine (DLE), which provides algorithms for dynamic, automated, and user-defined hypothesis generation utilizing global data resources; and

f. a knowledge extraction engine (KEE), which provides algorithms for dynamic, automated, and user-defined significance discovery and report generation.

8. The architecture in claim 5, wherein the engines further comprise:

a. a result aggregation engine (RAE), to validate, assemble, rank and tabulate results passed from the IOH and to generate output reports across diversified data subsets.

9. The architecture in claim 3, wherein the interfaces further comprise:

a. a direct information interchange interface (DII), which allows for rapid analysis and results aggregation by providing the interface for object-to-object and object-to-analysis tools via such related interfaces and engines including, but not limited to the OQI, OTE, and the DLE.

10. The architecture in claim 4, wherein the interfaces further comprise:

a. a graphical user interface (GUI), utilizing web-enabling standards including but not limited to Java and XML;

b. a direct instrument acquisition and control interface (DIAC), which provides bi-directional real-time communication between the IOH, the IMO and diverse instrumentation;

c. an application translation interface (ATI), to provide automated real-time detection of diverse data and applications and gate bi-directional access to the OTE, thus enabling functional, standardized integration of IMO data within heterogeneous data and applications environments;

d. an object query interface (OQI), comprising an interface for direct information interchange (DII) with IMO data, which initiates query analysis and results aggregation;

e. a result generation interface (RGI)) to provide validated, assembled, ranked and tabulated results to the RAE, thus enabling the generation of output reports across diversified data subsets; and

f. a legacy synchronization interface (LSI), to provide persistence and synchronization of offline legacy data.

11. The architecture in claim 4, wherein the interfaces further comprise:

a. an iPool integrity assessment interface (iPIA), to asses data integrity within a defined iPool for security and QA/QC;

b. a real-time meta-data link interface (RML), which provides for rapid relevant data access based on query parameters and MDX information;

c. a pool-to-pool query interface (PPQ), which provides for query optimization based on query parameters and relevant iPool data and meta-data intercommunication; and,

d. an IMO Zoomer (IMO-Z), which defines proximity and functional ranking of individual IMO data within the IOP and enables multidimensional IMO data viewing to represent object relationships within the pool and in relationship to other iPools.

12. An Architecture using interactive Objects for real-time, efficient, multidimensional, interdependent intelligent queries.

13. An Intelligent Object comprising a set of functional layers or panes.

14. An information technology system, comprising:

an Intelligent Molecular Object (IMO);

an Intelligent Object Handler (IOH); and

an Intelligent Object Pool (IOP);

said IMO, IOH, and IOP being adapted to communicate and interoperate with each other.

15. The information technology system as in Claim 14, wherein:

said Intelligent Molecular Object (IMO) providing a versatile, data-enabling software object, which further provides for real-time translation, integration, and object-to-object / object-to-analysis tools communication at the object data level, to allow multidimensional, platform-independent complex queries in real-time;

said Intelligent Object Handler (IOH) provides the application framework and user interface for IMO data, to allow for seamless integration of their benefits into legacy systems; and

said Intelligent Object Pool (IOP) comprising one global virtual data pool comprised of IMO data, which integrates diverse data resources on any system or network to provide result aggregation and instant answers across diversified data subsets.

16. The architecture in claim 14, wherein the IMO is further comprised of:

a unique identifier (UID), comprising a property pane layer created at IMO generation, which provides typically a multi-byte, alphanumeric unique identification on any system or network.

17. The architecture in claim 14, wherein the IMO is further comprised of:

an object access manager (OAM), a component within a property pane layer which governs data security and access according to UID permissions.

18. The architecture in claim 14, wherein the IMO is further comprised of:

an object root router (ORR), a component within a property pane layer which contains information to define the origin of the object within the system or network;

19. The architecture in claim 14, wherein the IMO is further comprised of:

an interactive content router (ICR), a component within a property pane layer which routes content and results interactively across the system or network;

20. The architecture in claim 14, wherein the IMO is further comprised of:

a status management component (SMC), interacting with an object state engine and certain interfaces, which monitors data integrity and command history in GLP/GMP-compliance via state history and governs table lookup actions via the ICR.

21. The architecture in claim 14, wherein the IMO is further comprised of:

a property pane controller (PPC), which controls the initiation of IMO communication according to an activation.

22. The architecture in claim 14, wherein the IMO is further comprised of:

vector subsets (VSS) for automatic, dynamic, or user-defined workspace definitions, which provide vectorized, direct addressing of data subsets for the ICR to minimize network traffic.

23. The architecture in claim 14, wherein the IMO is further comprised of:

meta-data indices (MDX), to provide efficient access via dynamically updated meta-data description relevant to extant data queries and definitions.

24. The architecture in claim 14, wherein the IMO is further comprised of:

object pane descriptors (OPD), which provide information about each object property pane and their function as required for direct communication with diversified applications and databases.

25. The architecture in claim 14, wherein the IMO is further comprised of:

an object query interface for direct information interchange (DII), which provides the interface to communication at the object level.

26. The architecture in claim 14, wherein the IMO is further comprised of:

an application translator link (ATL), which activates the OAM and ICR to determine the property panes for functional presentation and access within a given application or database environment.

27. The architecture in claim 14, wherein the IMO is further comprised of:

an object graph preview (OGP) pane, comprising a limited resolution image and graphics viewer for quick graphical data review, particularly of image data and spectral datasets.

28. The architecture in claim 14, wherein the IMO is further comprised of:

a raw data matrix (RDM), comprising a property pane which provides the full information subset for any data format or structure.

29. The architecture in claim 14, wherein the IMO is further comprised of:

matrix structure definitions (MSD), which allows for data field mapping and enables vector access to specific data fields.

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